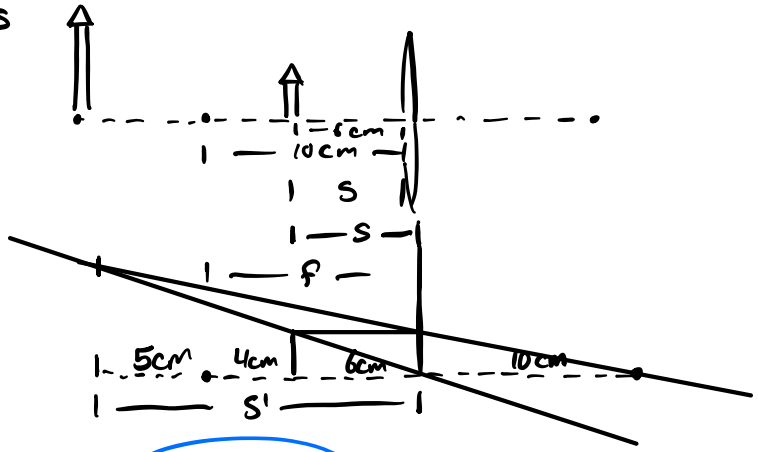
Problems : 26, 27, 32, 33

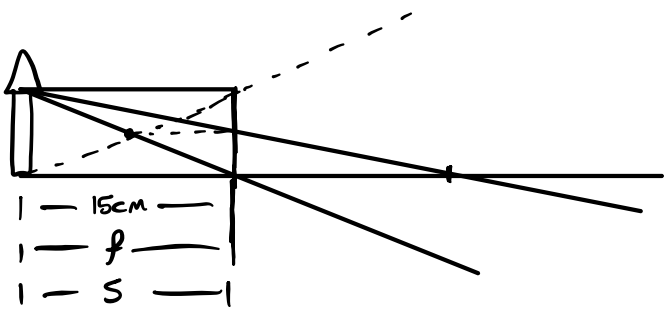
Problems

23.P.26



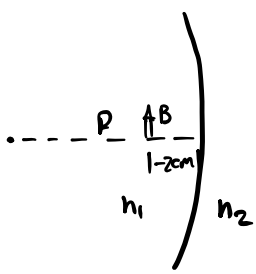
s' = 15cm upright

23.P.27



7.5cm

23.P.32



R = 4.0cm

$$\frac{n_1}{s} + \frac{n_2}{s'} = \frac{n_2 - n_1}{R}$$

$n_1 = 1.59$
$n_2 = 1.00$
$R = -4cm$
$s = 2cm$

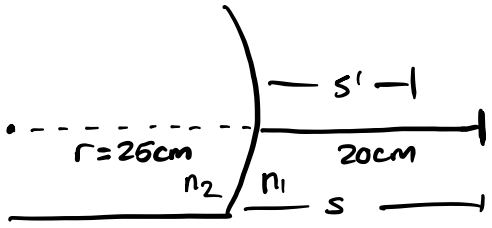
$$\frac{n_2}{s'} = \frac{n_2 - n_1}{R} - \frac{n_1}{s}$$

$$\frac{1}{s'} = \frac{\frac{n_2 - n_1}{R} - \frac{n_1}{s}}{n_2}$$

$$s' = \left(\frac{\frac{n_2 - n_1}{R} - \frac{n_1}{s}}{n_2} \right)^{-1} = \left(\frac{\frac{1.00 - 1.59}{-4cm} - \frac{1.59}{2cm}}{1.00} \right)^{-1} = -1.5cm$$

1.5cm beneath plastic barrier

23.P.33



$$\frac{n_1}{s} + \frac{n_2}{s'} = \frac{n_2 - n_1}{R}$$

$$\frac{n_2}{s'} = \frac{n_2 - n_1}{R} - \frac{n_1}{s}$$

$$\frac{1}{s'} = \frac{n_2 - n_1}{R n_2} - \frac{n_1}{s n_2}$$

$R = 25\text{cm}$
$n_1 = 1.00$
$n_2 = 1.33$
$s = 20\text{cm}$

$$s' = \left(\frac{n_2 - n_1}{R n_2} - \frac{n_1}{s n_2}\right)^{-1} = \left(\frac{1.33 - 1.00}{25\text{cm}(1.33)} - \frac{1.00}{20\text{cm}(1.33)}\right)^{-1} = -36.14\text{cm}$$

36.14cm away